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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

MAILED

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Technology Center 2100

Application Number: 09/752,861
Filing Date: December 28, 2000
Appellant(s): DAVIS ET AL.

Rochelle Lieberman
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed January 23, 2006 appealing from the Office action mailed October 26, 2004.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is partly correct. The amendment after final submitted December 22, 2004 was denied entry in the Advisory Action response thereto on January 15, 2005.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

NEW GROUND(S) OF REJECTION

Whether claims 13 and 15-21 are properly rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter.

(7) Claims Appendix

A substantially correct copy of appealed claims appears on page 14 of the Appendix to the appellant's brief. The minor errors are as follows: Claim 7, second word of line 2 is "unto" rather than "into". Claim 17, fifth word of line 1 is "1" rather than "13". Claim 18, last word of line 2 is "shared" rather than "share".

(8) Evidence Relied Upon

6,701,421	ELNOZAHY et al.	3-2004
6,549,963	SAYLES	4-2003

(9) Grounds of Rejection

The following objections were made in the final rejection, without satisfactory resolution:

Claims are objected to because of the following informalities: In claim 9 the second descriptor is stated to be selected from a group of descriptors not related to performance, and in claim 12 the first descriptor is stated to reflect average latency (related to performance); however, in claim 1 it was stated that the <u>second</u> descriptor is of respective performance. Have "first" and "second" in claims 9 and 12 been reversed? This applies to similar language in claims 18 and 21, although both of these state "second" (apparently one should state "first"). Appropriate correction/clarification is required.

The following objection regards one of the errors in the claims appendix of the brief:

Claim 17 should depend on claim 13 rather than claim 1. The claims appendix had been changed to show this, but without a proper amendment on the record.

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Elnozahy et al., US 6,701,421 B1, in view of Sayles, US 6,549,963 B1.

As to claims 1, 13, 16, and 22, Elnozahy discloses *a computer system, article, and method with multiple processors and plurality of resources assigned to node groups* (see Figs. 1 and 2), *wherein a first descriptor of respective topological levels of at least one resource is produced by firmware* (BIOS). See Abstract, col. 1 lines 41-52 (there is a need to provide operating system awareness of remote resources), col. 2 lines 17-29 ("a configuration table indicative of the systems hardware resources including the system's physical memory is generated in response to a boot event"), col. 4 lines 6-10 ("BIOS 306 may be responsible for creating configuration tables") and 22-26, and col. 4 line 43 to col. 5 line 4; note that BIOS generates the configuration tables, which identifies the nodes and amount of memory on each node, and thus describes topological levels as recited. The configuration tables of Elnozahy do not necessarily teach *a second descriptor of the respective performance of the resources*. However, Sayles teaches the use of firmware to initialize configuration settings that control performance as well as other characteristics of multiple devices attached to a network, the data of the configuration settings thus reading on the second descriptor (see Sayles col. 1 lines 51-56, col. 2 lines 26-33 ("During system initialization, the system may adjust settings in devices coupled to a bus to indicate communications characteristics that are

supported by the devices."), col. 2 line 55 to col. 3 line 26 ("... communications characteristics ... may include ... the address space accessible by the devices ... whether special high-rate read or write transfers are supported ..."), and col. 5 lines 13-22 and 35-42). The BIOS in Sayles loads not only configuration information that identifies performance of devices, but also the address space accessible by them (in addition to other characteristics), and thus Sayles teaches what may be interpreted as multiple descriptors generated or produced by firmware. Additionally, Elnozahy teaches that the multinode system therein may contain nodes having multiple devices on a bus (see Elnozahy col. 3 lines 30-40). An artisan would have been motivated to add a second descriptor of performance of resources to the system of Elnozahy because as taught by Sayles it would have provided the advantages of control over multi-device networks to maintain signal integrity, compensation for different types of power supplies for the devices, and also the ability to change characteristics for testing purposes (see Sayles col. 1 lines 38-42, and col. 5 line 65 to col. 6 line 24). It is apparent from col. 2 lines 21-25, and from the claims of Sayles (which neglect to recite AGP) that the teachings therein are not solely to AGP devices but rather to any system having communication channels with multiple devices. Thus it would have been obvious to one of ordinary skill in the art at the time of the invention to add the second descriptor produced by firmware, because it was a known method to control signal integrity, compensate for power supplies, and allow testing under changing characteristics.

As to claim 2, the descriptors taught as described above may be considered first level and primary data structures to the extent recited.

As to claim 3, since the configuration table in Elnozahy maps addresses it contains a pointer to a secondary data structure.

As to claims 4 and 17, each node has an identifier in Elnozahy.

As to claim 5, the identifiers represent multiple interconnect levels as recited since a node may have multiple levels (for example, processor and memory).

As to claims 6-7, Elnozahy dynamically updates the descriptor as recited since the HAL modifies the BIOS generated configuration.

As to claim 8, Sayles dynamically updates the other descriptor as recited (see col. 5 lines 65-66).

As to claims 9, 18, and 25, the descriptor of the prior art combination is selected from a group that includes descriptors of the recited elements.

As to claims 10 and 19, since the descriptors of Elnozahy describe the hardware at each node, the interconnects are reflected as recited.

As to claims 11, 20, and 26, the descriptor of Sayles may be considered part of the recited elements of the other descriptor in the combination, that of Sayles incorporating the latency as recited.

As to claims 12, 21, and 27, since transfer rates are given by Sayles, the average latency which is directly calculable from this is reflected or maintained as recited.

As to claims 14 and 15, the medium consists of both recordable storage and modulated carrier.

As to claim 23, traversing the data structure must be done in Elnozahy to use the configuration table to identify nodes and hardware therein.

As to claim 24, accessing a second data structure is disclosed in Elnozahy since the configuration table maps addresses.

As to claim 28, recursively accessing additional data structure levels is inherent to the extent recited since data is accessed at processor and memory levels.

NEW GROUND(S) OF REJECTION

Claims 13 and 15-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. Claim 13 recites an article comprising computer-readable signal bearing medium readable by a computer and having two determining means. Claim 15 clarifies that the medium may be a modulated carrier signal. Thus, claim 13 covers a modulated carrier signal itself rather than a tangible, physical article or object which may include the signal, since there is nothing claimed as part of the article to establish it as a tangible, physical article or object; as such, the claim is not limited to embodiments which fall within a statutory category of invention.

(10) Response to Argument

It is first noted that Appellants do not dispute the teaching of any independent claims limitations other than the descriptors. Additionally, Appellants admit that Elnozahy et al. teach firmware to produce the first descriptor, and that Sayles teaches firmware to produce the second descriptor. See brief page 4 last paragraph and page 5 first paragraph (which describe the two references having BIOS (i.e., firmware) that produces descriptors), page 6 lines 3-5 ("At most, Elnozahy et al. teach firmware to produce only one of the two descriptors . . . At most Sayles teaches only one of the two

descriptors."), and page 7 lines 13-16 ("Here Elnozahy et al. teach the use the first descriptor . . . While Sayles teaches the second descriptor . . ."). The only issue regarding the first group of claims to be reviewed on appeal, claims 1, 4, 5, 13-17, 22-24, and 28, is whether it would have been obvious to combine the teachings of the firmware that produce each descriptor into a computer system, article, and method as claimed (see brief pages 5-7, sections B and C).

The Appellants argument that each reference does not teach or motivate to expand beyond its own descriptor (brief section 7.I., pages 3-7) is untenable in view of the broadness of the independent claims. The claims do not require the two descriptors to be generated by the same firmware, or even to describe the same resource(s). Claim 1 only requires that two descriptors or resources are produced by firmware in the same multiple processor system. Claim 13 only requires the equivalent of the descriptors, the determining means, to be stored in firmware of the system (the system not necessarily being part of the claimed article). Claim 22 only requires maintaining the respective descriptions as at least one data structure produce by firmware. In no case do these claims require motivation be found to combine the teachings of the references such that the firmware must somehow be combined into a single firmware that produces both descriptors. What is required is a system that has firmware that produces the first descriptor, and firmware that produces the second descriptor. The claimed computer system has multiple processors, which includes the interpretations of multiple processors at a single node, at multiple nodes, and even of multiple computers connected via busses or networks. Each reference teaches the benefits of providing

firmware to produce the descriptor described therein, as detailed in the rejections above. Thus, each teaches the benefits of adding their respective described embodiments, including their respective firmware and the descriptor that it produces, to a computer system as claimed.

Notwithstanding the response above, each reference teaches firmware that produces data which has been interpreted hereinabove as the claimed descriptors. However, the firmware of each reference produces a plurality of data that may be interpreted as multiple descriptors. Elnozahy as cited hereinabove generates a configuration table that identifies hardware components, and indicates the memory sizes of the nodes. Sayles as cited hereinabove generates data settings in devices that identify operating characteristics such as accessible address space, number of commands that may be queued, performance characteristics, etc. It is therefore maintained that it would have been obvious to an artisan looking at each of these references that firmware could advantageously generate multiple descriptors, and in particular motivates generation of the descriptors as recited.

Appellants argument that neither Elnozahy et al. nor Sayles teach that their respective descriptors are in the form of a data structure (brief section 7.II., pages 7-9) does not provide any evidence preventing the descriptors therein from being interpreted as data structures. A data structure is generally an organization scheme, such as a record or an array, applied to data so that it can be interpreted and so that specific operations can be performed upon that data. As defined in MPEP 2106, a data structure is "a physical or logical relationship among data elements, designed to support

specific data manipulation functions." Applicants disclosure does not provide any further narrowing definition. Thus, a configuration table as described in Elnozahy et al., and configuration settings initialized into registers as described in Sayles, may be considered data structures to the extent claimed, since the data must be stored with known physical and logical relationships in order to get the correct configuration data.

Appellants argument that neither Elnozahy et al. nor Sayles teach a dynamic updator (brief section 7.III., pages 9-13) likewise does not provide any support that prevents the updating of the descriptors in the references being interpreted as the dynamic updator. Appellants admit that Elnozahy updates the BIOS (brief page 10), but argues that there is no support for update of a second descriptor. However, it is clear that in Sayles (see e.g. col. 5 line 65 to col. 6 line 45) that the BIOS routine therein updates the configuration data as needed. Any such updating is dynamic to the extent claimed. Alternatively, Elnozahy teaches multiple descriptors as described hereinabove. Because Elnozahy teaches dynamic update of the BIOS (as admitted by Appellant), Elnozahy thus teaches dynamic update of multiple descriptors, which obviously includes any descriptor added, such as that taught by Sayles.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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Primary Examiner

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